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EXAMINER

NICKERSON, JEFFREY L

ART UNIT

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/583,964

Applicant(s)

BONSMA ET AL.

Examiner

JEFFREY NICKERSON

Art Unit

2142

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 June 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 13 October 2006.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

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### DETAILED ACTION

1. This communication is in response to Application No. 10/583,964 filed nationally on 21 June 2006 and internationally on 10 December 2004. The preliminary amendment presented on 21 June 2006, which provides change to the specification and claims 3, 5, 8, 9, 15-19, and 21, is hereby acknowledged. Claims 1-21 have been examined.

### *Drawings*

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: All 400s (pg 12, par 3-4), All 500s (pg 12, par 5), All 600s, (pg 13, par 1), All 700s (pg13, par 3), All 800s (pg 13, par 4), All 900s (pg 13, par 5), All 1000s (pg 14 par 3-5; pg 15, par 1-3; pg 16, par 2).

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required

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corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

3. Applicant is reminded of the proper language and format for an abstract of the disclosure. The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details. The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

4. The abstract of the disclosure is objected to because it is too long and uses implied phraseology. The sentence beginning "For use in this system..." contains the phrase "is described" at its end. This falls into the category of implied phraseology and therefore needs to be removed. Correction is required. See MPEP § 608.01(b).

***Claim Objections***

5. Claims 16-21 are objected to because of the following informalities: Differing classes of invention between dependent claims and their parents.

Regarding claims 16-21, these claims depend on a parent claim that has a different class of invention. The preamble of these dependent claims make claim to a network when the parent independent claims make claim to a system or computer. Dependent claim chains should be consistent in the category of subject matter being claimed. Appropriate correction is required.

6. Claims 21 is objected to under 37 CFR 1.75(d)(1) because of the following informalities: lack of antecedent basis.

Regarding claim 21, this claim recites the limitation "the secondary network" in line 2. There is insufficient antecedent basis for this limitation in the claim. Correction is required.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Theimer et al (US 2003/0187812 A1), and further in view of Kao (US 5,870,734).

Regarding claim 1, Theimer teaches a distributed computer system comprising a plurality of computers (Theimer: abstract; See also Figure 1):

wherein said computers store data items (Theimer: abstract specifies data records), each data item being assigned to one of a plurality of virtual directories (Theimer: [0005])

wherein each computer that has a said data item stored thereon has at least one node of a virtual network (Theimer: [0006] specifies use of overlay network) for directory lookup (Theimer: [0005] specifies that the original server sends the request to the responsible server, which inherently means it can determine the responsible server that maintains the master copy of the record)

said node comprising:

data identifying one of the plurality of virtual directories with which the node is associated; (Theimer: [0028]; [0037] specifies use of associated subdirectories)

linking data comprising addresses of other such nodes (Theimer: [0006]-[0008] specifies the nodes can determine the nodeID's of servers)

and software operable:

in response to an inquiry message identifying another of the virtual directories to forward the message to another node of the network (Theimer: [0038]-[0040] specify

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that the servers continue forwards the message toward the node that maintains the master directory copy)

in response to an inquiry message identifying the virtual directory with which the node is associated to generate a reply message identifying the computer (Theimer: [0040] specifies that the record is then sent to the client once a copy of the directory is found; [0006] specifies the use of IP-routing, which inherently use IP packets containing source addresses)

wherein each computer that has a said data item stored thereon has, for each item stored thereon, a node of a network for item lookup, (Theimer: [0008] specifies that each node can hash the record to determine which node contains its master copy)

said node comprising:

data identifying the item with which the node is associated (Theimer: [0008])

linking data comprising addresses of other such nodes each associated with an item assigned to the same virtual directory, whereby said linking data together define a plurality of computers for item lookup; (Theimer: [0057]-[0061] specifies the routing technique used to identify which nodes to route data requests to; [0062]-[0063] specify how leaf sets are used)

software operable:

in response to an inquire message identifying another of the items to forward the message to another node of the network (Theimer: [0007] and [0008] specify forwarding if the data record isn't on the current node);

in response to an inquiry message identifying the item with which the node is associated to generate a reply message including the item (Theimer: [0040] specifies the data record is returned to the client)

wherein at least one computer has retrieval means responsive to receipt of a query identifying a directory and an item within that directory (Theimer: [0008] and [0028]) to:

send to a node of the network for directory lookup an inquiry message identifying the directory (Theimer: [0038])

upon receipt of a reply message thereto, to send to the computer identified in the reply message an inquiry message identifying the item (Theimer: [0033])

to receive the reply message containing the item (Theimer: [0040]).

Theimer does not teach a plurality of virtual networks for item lookup and wherein each network corresponds to a different virtual directory.

Kao, in a similar field of endeavor, teaches wherein virtual nodes are connected, thus forming a virtual network (Z-stack), and wherein the connected nodes form a respective different directory. (Kao: figure 4; col 6, lines 29-40)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the teachings of Kao for using virtual nodes to form directory stacks. The teachings of Kao, when implemented in the Theimer system, will allow one of ordinary skill in the art to distribute directories across multiple nodes. One of ordinary skill in the art would be motivated to utilize the teachings of Kao in the



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Theimer system in order to accommodate more diverse file systems that span multiple nodes or physical locations.

Regarding claim 2, this system claim comprises limitations corresponding to that of claim 1 and the same rationale of rejection is used, where applicable. And wherein:

in response to a request message identifying the item with which the node is associated to generate a reply message including the item (Theimer: [0040]);

upon receipt of a reply message thereto, to send to the computer identified in the reply message a message requesting the item (Theimer: [0038]-[0039]).

Regarding claim 3, the Theimer/Kao system teaches wherein the computer having retrieval means includes secondary retrieval means operable:

upon receipt of a reply message identifying a computer having one or more items in a particular directory to identify further computers having one or more items in that directory (Kao: abstract specifies the nodes can specify physical storage locations; col 6, lines 41-58 specifies searching through directories for files);

to create a list of items in that directory (Kao: col 6, lines 20-28; See also Figures 3-4).

Regarding claim 4, the Theimer/Kao system teaches wherein each computer that has a said data item stored thereon also has at least one node of a secondary virtual network for directory lookup, such that said nodes together form a respective secondary virtual

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network for each virtual directory, wherein said node comprising a data storage area for containing a list of addresses of other nodes of the secondary virtual network that have items in the same directory and said node is responsive to inquiry messages to return a message containing the addresses of the list (Kao: Figure 2; col 6, lines 20-28 specify that information in one directory may span across multiple Z-stacks and be retrievable when a user is browsing those directories, thereby returning it);

and wherein the secondary retrieval means is operable, for identifying further computers having one or more items in the directory in question, to send an inquiry message to the node identified by the reply message and upon receipt of a response to iteratively send inquiry messages to addresses contained in the response to that inquiry message or as the case may be in a response to a subsequent inquiry message. (Kao: col 6, lines 20-60 specifies identifying multiple nodes spanning a single directory, iteratively searching their corresponding Z-stacks which consists of returning results to the user; See also Figure 2)

Regarding claim 5, the Theimer/Kao system teaches wherein some of said directories are assigned, as subdirectories, to another of said directories (Kao: Figure 2) and wherein the or each computer having retrieval means includes also:

first subdirectory retrieval means responsive to input of a directory name to identify a computer node having items in at least one subdirectory assigned to that directory (Kao: col 6, lines 20-60 specifies retrieving subdirectory and file information; Figure 2);

second subdirectory retrieval means connected to receive an address identified by the first subdirectory retrieval means and operable in response thereto to identify further computing nodes having items in at least one subdirectory assigned to the same directory (Kao: col 6, lines 20-60 specifies recursively searching down the subdirectories to identify related nodes; Figure 2).

Regarding claim 6, this computer claim comprises limitations corresponding to that of claim 1 and the same rationale of rejection is used, where applicable.

Regarding claim 7, this computer claim comprises limitations corresponding to that of claim 2 and the same rationale of rejection is used, where applicable.

Regarding claim 8, this computer claim comprises limitations corresponding to that of claim 3 and the same rationale of rejection is used, where applicable.

Regarding claim 9, this computer claim comprises limitations corresponding to that of claim 5 and the same rationale of rejection is used, where applicable.

Regarding claim 10, the Theimer/Kao system teaches wherein the retrieval means is operable to compile a composite list of said subdirectories. (Kao: col 6, lines 20-60; Figure 2)

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Regarding claim 11, the Theimer/Kao system teaches comprising a plurality of computer nodes, wherein each computer stores data items, each data item being assigned to one of a plurality of virtual directories, the network having:

first retrieval means responsive to input of a directory name to identify a computing node having items in that directory (Theimer: [0038] specifies directory input; Theimer: [0008] specifies identifying node having that item);

second retrieval means connected to receive an address identified by the first retrieval means and operable in response thereto to identify further computing nodes having items in the same directory (Kao: col 6, lines 20-60 specify searching to find other nodes);

wherein each computing node having items in a given directory has associated with it a data storage area for containing addresses for other computing nodes having items in the same directory and is responsive to enquiry messages to return a message containing the addresses of the list (Kao: col 6, lines 20-60 and Figure 2);

and wherein the second retrieval means is operable to send an enquiry message to the node identified by the first retrieval means and upon receipt of a response to iteratively send enquiry messages to addresses contained in the response to that enquiry message or as the case may be in a response to a subsequent enquiry message, thereby identifying a plurality of computing nodes having items in the directory in question (Kao: col 6, lines 20-60 and Figure 2).

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Regarding claim 12, the Theimer/Kao system teaches wherein the retrieval means is operable to retrieve from each of said identified plurality of computing nodes a list of items stored thereon, and to compile a composite list of said items. (Kao: col 6, lines 20-60 and Figure 2)

Regarding claim 13, this distributed computer system claim comprises limitations corresponding to that of claim 11 and the same rationale of rejection is used, where applicable. And wherein the system can handle subdirectories and identify nodes with subdirectories. (Kao: col 6, lines 20-60 and Figure 2)

Regarding claim 14, this distributed computer system claim comprises limitations corresponding to that of claims 12 and 13 and the same rationale of rejection is used, where applicable.

Regarding claim 15, this distributed computer system claim comprises limitations corresponding to that of claims 11 and 13 and the same rationale of rejection is used, where applicable.

Regarding claim 16, the Theimer/Kao system teaches wherein

the first retrieval means is formed by a primary network of virtual nodes, each node being defined by a list of links to other nodes of the secondary network, each entry

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in the list including a label (name) and address (pointer to) of the respective other node (Kao: col 6, lines 20-60; Figure 2);

and wherein each node includes means responsive to receipt of a request message containing a label to propagate the request message within the network (Kao: col 6, lines 41-58);

and means responsive to receipt of a request message containing a label matching the label of the node receiving it to generate a reply message (Theimer: [0040]).

Regarding claim 17, the Theimer/Kao system teaches wherein

the second retrieval means is formed by a secondary network of virtual nodes, each node being defined by a list of links to other nodes of the primary network, each entry in the list including an address of the respective other node (Kao: col 6, lines 20-60; Figure 2);

and wherein each node includes means responsive to receipt of a request message to generate a reply message containing the addresses of the list (Kao: col 6, lines 20-28 specify all addresses are returned to the user).

Regarding claim 18, this network claim comprises limitations corresponding to that of claims 16 and the same rationale of rejection is used, where applicable. And wherein in which the reply message generated by a node of the primary network includes the

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address of that node of the secondary network which is associated with the node generating the reply message. (Kao: col 6, lines 20-60 and Figure 2)

9. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Theimer et al (US 2003/0187812 A1) and Kao (US 5,870,734), and in further view of Bonsma (WO 03/034669).

Regarding claim 19, the Theimer/Kao system teaches wherein

the second retrieval means is formed by a secondary network of virtual nodes, each node being defined by a list of links to other nodes of the primary network, each entry in the list including an address of the respective other node (Kao: col 6, lines 20-60; Figure 2);

The Theimer/Kao system does not explicitly teach wherein each node includes means operable and to propagate exploratory messages each containing the label and address of the initiating node and wherein each node is operable upon receipt of an exploratory message containing a label matching that of the receiving node and an address not matching that of the receiving node to generate a notification message for addition of a link to the secondary network, said notification message identifying the node initiating the exploratory message and containing the address of the node of the secondary network associated with the receiving node.

Bonsma, in a similar field of endeavor, teaches wherein each node includes means operable to propagate exploratory messages (query or FIND messages) each

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containing the label and address of the initiating node (Bonsma: pg 15, line 9-12) and wherein each node is operable upon receipt of an exploratory message containing a label matching that of the receiving node and an address not matching that of the receiving node to generate a notification message for addition of a link to the secondary network (Bonsma: abstract) said notification message identifying the node initiating the exploratory message and containing the address of the node of the secondary network associated with the receiving node (Bonsma: pg 15, lines 24-26).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the teachings of Bonsma for searching for neighboring nodes. The teachings of Bonsma, when implemented in the Theimer/Kao system, will allow one of ordinary skill in the art to create a bootstrapping content addressable network. One of ordinary skill in the art would be motivated to utilize the teachings of Bonsma in the Theimer/Kao system in order to allow discovery and link management in the distributed content addressable networking environment.

Regarding claim 20, the Theimer/Kao/Bonsma system teaches wherein the notification message contains, as destination, the address of the initiating node (Bonsma: abstract) and the initiating node is operable upon receipt thereof to forward to the node of the secondary network associated with the initiating node a message requesting addition of a link between it and the node having the address contained in the notification message (Bonsma: pg 34, lines 21-27).



10. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Theimer et al (US 2003/0187812 A1) and Kao (US 5,870,734), and further in view of Yemini et al (US 2002/0163889 A1).

Regarding claim 21, the Theimer/Kao system does not teach adding and removing addresses of neighboring nodes to routing lists.

Yemini, in a similar field of endeavor, teaches wherein each node of a secondary network includes processing means programmed to perform the following operations:

receiving messages (Yemini: [0035]);

responding to messages requesting information about the contents of the list (Yemini: [0037]);

complying with received requests to remove an address from the list and insertion of another address into the list (Yemini: [0037]);

in response to receipt of a message requesting a link between the node and a second node (Yemini: [0037]);

generating a message to the second node requesting information about the contents of its list (Yemini: [0072]-[0075]);

determining whether both the first node and second node has in each case a number of addresses in its list which is less than the predetermined number (Yemini: [0068] specifies nodes exchange only the best labels/neighbors);

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in the event that this condition is satisfied, inserting into its list the address of the second node and generating a message to the second node requesting the second node to add to its list the address of the node (Yemini: [0069]);

in the event that this condition is not satisfied, determining whether the node has a number of addresses in its list which is at least two less than the predetermined number, and if so- selecting from the list of the second node the address of a third node; inserting the address of the second node into the list of the first node and inserting the address of the third node into the list of the first node; generating a message to the second node requesting the removal of the address of the third node from the list of the second node and insertion of the address of the node; generating a message to the third node requesting the removal of the address of the second node from the list of the third node and insertion of the address of the node. (Yemini: [0098]-[0100] specifies that when a node moves, the address are removed from the adjacent nodes it leaves and the address is added to the adjacent nodes it moves to; See also Figure 7)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the teachings of Yemini for managing node links. The teachings of Yemini, when implemented in the Theimer/Kao system, will allow one of ordinary skill in the art to dynamically manage node links in a distributed content addressable network. One of ordinary skill in the art would be motivated to utilize the teachings of Yemini in order to allow the network to self-adjust when nodes are added or removed in real-time.

**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JEFFREY NICKERSON whose telephone number is (571)270-3631. The examiner can normally be reached on M-Th, 8:30-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Caldwell can be reached on 571-272-3868. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. N./  
Examiner, Art Unit 2142



ANDREW CALDWELL  
SUPERVISORY PATENT EXAMINER